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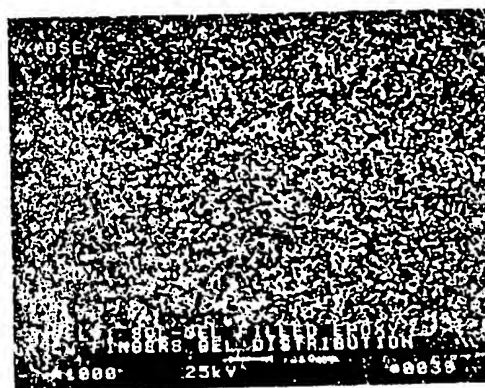
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11.08.93 Bulletin 93/32(71) Applicant: **International Business Machines
Corporation
Old Orchard Road
Armonk, N.Y. 10504(US)**(72) Inventor: **Mukherjee, Shyama P.
45 Mountain Pass Road
Hopewell Junction, N.Y. 12533(US)
Inventor: Wang, David W.
800 Overbrook Road
Vestal, N.Y. 13850(US)**(74) Representative: **Mönig, Anton, Dipl.-Ing.
IBM Deutschland Informationssysteme
GmbH, Patentwesen und Urheberrecht
W-7000 Stuttgart 80 (DE)**(54) **Low dielectric constant composite laminates filled with molecularly porous aerogels.**

(57) A low dielectric constant, controlled coefficient of thermal expansion, low cost material which includes uniformly distributed aerogel microspheres having voids in molecular dimension (at nanoscale) is prepared by extrusion and standard impregnation and lamination techniques. The aerogel microspheres are prepared by sol-gel technique and supercritical drying of the sol-gel particulates. Laminates including this material can be drilled cleanly for through holes and can be used as a substrate for surface mounted devices. Also, these low dielectric aerogel microsphere containing composite resins, when the resin is a photosensitive polymer, can be applied to substrate surfaces such as ceramic or multilayer ceramic substrates and photolithographically processed.

**FIG. II****EP 0 512 401 A3**



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EUROPEAN SEARCH REPORT

Application Number

EP 92 10 7329

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0 304 699 (JUNKOSHA CO) * column 2, line 31 - column 3, line 1; claim 1 * ---	1	H 01 B 3/30 H 01 B 3/40 H 01 B 3/44 C 08 K 7/26 H 05 K 1/03
A	EP-A-0 382 557 (JUNKOSHA) * claim 1 * ---	1	
A,P	EP-A-0 440 918 (IBM) * claims 2,4,8 * ---	1	
A,P	EP-A-0 442 363 (IBM) * column 4; claim 1 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			H 01 B C 08 K H 05 K C 08 L C 08 J
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 21-01-1993	Examiner LENTZ J C
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	

EP 92 10 7329 (1993)



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

• See sheet -B-

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.

namely claims: 1-14



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LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1-14: Dielectric material, circuit board
2. Claim 15 : Making circuit pattern